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Epidote occurrence in pegmatite veins and its relation to the metamorphic host suite in the Dunje area, Republic of Macedonia

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: The Precambrian metamorphic suite of the Pelagonides hosts pegmatite veins in the area south of Prilep, Macedonia. A pegmatite body outcropping near the village of Dunje is notable for euhedral epidote crystals, titanite, large plagioclase crystals, amphibole and zeolite. The pegmatite intrudes gneiss of the host suite but its contact to the country rocks is not exposed well. The boundary zone becomes more prominent in the pegmatite top section. Pegmatite veinlets, a few centimeters to a decimeter in width, occur in vicinity of the larger pegmatite body and are mainly composed of quartz, feldspar and muscovite. A distinguishing local feature is occurrence of epidote not only in the Dunje pegmatite but also in the rocks of the metamorphic suite as well as in the nearby granite intrusion. Along epidote, the well-foliated host gneiss also contains amphibole, plagioclase, quartz and titanite. In the upper contact zone to the pegmatite it is less foliated and more enriched in epidote. The adjacent granite body outcrops with a typical spherical exfoliation and a mineral composition comprising abundant quartz, orthoclase (occasionally perthitic) and biotite mica. Smaller elongated or irregular grains of epidote are also observed together with titanite. The omnipresence of epidote in the Dunje complex imposes questions on genetic relations between the pegmatite and the surrounding rocks. Scanning electron microscopy with energy dispersive spectrometer (SEM-EDS) indicated a slight inhomogeneity in epidote grains in all the rocks of the complex. A single euhedral crystal of epidote about 1,5 cm in length and recovered from the pegmatite, was cut in three sections perpendicularly to the elongation axis and prepared for the SEM-EDS analysis. The chemical data on major constituents indicate that the crystal is fairly homogeneous both along the elongation axis and perpendicular to it. The only peculiarity is a slight substitution of Mg in the middle section of the crystal and towards one end of the crystal. Preliminary chemical analysis also shows an increase of Fe content in epidote from the pegmatite and especially from the granite relative to epidote from the host gneiss. Epidote from the epidote-rich gneiss in the contact zone has a higher Fe/Al ratio compared to the epidote from typical host gneiss in the area, yet this is less pronounced than in the granite and pegmatite. The sequence of epidote Fe/Al ratio variation in the rocks of the Dunje complex suggests a relation of metamorphic host and thereof potentially evolved granite and pegmatite melts. More significant iron enrichment in the granite epidote might be a result of differences in iron partitioning between epidote and biotite mica vs. epidote and amphibole in the pegmatite, however, constrained by P-T conditions and fO_2 in both systems (Chang & Andronicos, 2009). A thorough chemical and textural analysis is in progress to establish more accurate genetic relations between epidote occurrences in the rocks of the Dunje complex.

References: Chang, J. M. & Andronicos, C. L. (2009): Constraints on the depth of generation and emplacement of a magmatic epidote-bearing quartz diorite pluton in the Coast Plutonic Complex, British Columbia. Terra Nova, 21, 480–488